Cognitive Computing and AI – Final Project Proposal

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Survey on Goal-oriented Dialogue Systems

The overall objective is to survey the latest research papers that are related to goal oriented dialogue systems.

Goal oriented dialogue systems (or chatbots) are those systems which have a goal oriented task. For example: Movie booking chatbot, Travel Manager chatbot, a company's customer care bot.

We will be researching a lot of literature and code bases on goal oriented dialogue systems and will present a survey paper that will first introduce:

- Goal oriented chatbots how they are different from Non-goal-based dialogue systems.
- Recurrent Neural Network based dialogue systems.
- Reinforcement learning based dialogue systems.
- Research challenges faced in this area.

Next, although we will talk about a lot of papers but the main portion of our survey we have the discussion on the below four research papers. We will run experiments on these with a specific dataset, compare the architecture and document the challenges and shortcomings of each paper.

1. End-to-End Task-Completion Neural Dialogue Systems [link]
2. A User Simulator for Task-Completion Dialogues [link]
3. Learning Conversational Systems that Interleave Task and Non-Task Content [link]
4. Learning End-To-End Goal-Oriented Dialog[link]

The motivation behind choosing these papers is that they resonate the latest research that is going on in this field. All these papers are 2017 released.

The first paper presents an end-to-end learning framework for task-completion neural dialogue systems, which leverages supervised and reinforcement learning with various deep-learning models.

The second paper takes on the problem of building an appropriate dataset for goal-oriented dialogue systems. It proposes a technique where it can use a RL agent to act as a simulator and then use that simulator in place of user simulator and generate a corpus example dialogues.

The third paper provides a solution to the problem when goal based dialogue systems fail if user's intentions are not explicit. It proposed a framework to interleave non-task content (i.e. everyday social conversation) into task conversations. When the task content fails, the system can still keep the user engaged with the non-task content.

The fourth paper proposes an architecture where it breaks down the conversation into various tasks. The bot should also decide on asking the right questions to make an accurate suggestion. The tasks require manipulating sentences and symbols in order to properly conduct conversations, issue API calls and use the outputs of such calls. It also shows that an end-to-end dialog system based on Memory Networks can reach promising performance and learn to perform non-trivial operations.